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seem to have been branches of one great basin during the Upper Coal epoch. They were separated by a tongue of land tapering southwardly and terminating in West Virginia, not far from the Maryland line. The eastern basin rapidly lost its width, and near the union was quite narrow. The relation between the two basins, as I understand it, is rudely represented in the accompanying figure, in which A, is the western, and B, the eastern, which latter now contains the fragmentary areas of semi-bituminous and anthracite coal.

Whether or not this division of the coal-field existed from the beginning of the period, I am unable to conjecture, as my material respecting the Lower Coal Group is not sufficient. But that it had occurred before the formation of the Barren Group admits of no doubt, as that group has a well-defined saucer-shape in the Great Trough, and thickens eastwardly from the dividing area. In like manner the Upper Coal Group thickens east and west from the same region, the Pittsburg, Redstone and Sewickly Coals being as well marked in the eastern basin as in the western.

The eastern basin, as might have been expected, shows little limestone amid its strata. Surrounded on all sides by highlands, it was fed by numerous streams, which brought down sufficient detritus to render its waters turbid throughout. Its mouth was obliterated topographically by the final convulsions of the Appalachium Revolution, so that its precise position is to be ascertained only by close exploration.

The common basin, below the junction of these branches, was broad and never completely filled with detritus so as to permit the marshes to cross it; certainly at no time after the formation of the Pittsburg in that region. This bed cannot be traced across the basin, owing to the fact that it is deeply concealed in the centre, but the Waynesburg and Brownsville thin out rapidly toward the west, and in West Virginia, have almost disappeared before reaching the disturbed region known as the "Oil-break." Limestones are almost unknown, and for four hundred feet on top, the rocks are entirely sandstone and shale, all the limestones and coals belonging to that horizon being absent.

ON EXFOLIATION OF ROCKS NEAR GETTYSBURG.

By P. Frazer, Jr.

(*Read before the American Philosophical Society, Dec. 4th,* 1874.)

During an examination which I made of the Syenite boulders which compose that part of the battle-field of Gettysburg, called the "Devil's Den," (a collection of great blocks of this rock piled one on another in the wildest confusion and lying about $\frac{1}{3}$ mile west of "Granite Spur" or Little Round Top, the ravine where Vincent's Brigade held their ground so manfully on the afternoon of Thursday, July 2, 1863, and

Round Top proper, where the Sixth Corps of the Army of the Potomac intrenched during the night of the 2d and the morning of the 3d,) my attention was directed to a singular example of weathering which was so entirely novel to me, that I determined to secure specimens of it for exhibition to this Society as well as the Academy of Natural Sciences.

It seems to open to me a new view of concretionary structure as well as surface weathering, and is an important item for consideration when the rock is intended for building purposes.

The fracture of these rocks (and indeed of all rocks) should be subdivided into—

1. Fracture on *large* planes.
2. Fracture on small planes.

It is essential to know whether reference is made to large or small planes when the kind of fracture is described in all rocks, for though the general habit of the large plane may be a curved surface where this is shown in the original boulder, the smaller fragments may exhibit splintery, earthy, or any other fracture.

Several of these large boulders are visible in the "Devil's Den," which present 100 square yards or more of surface, and in one or two cases where the fracture seems to have been recent, the surface is very homogeneous, the curve very smooth, and the rock very sound and hard, and with a bluish gray color entirely different from the brown which it assumes in places where it has been more exposed to the weather.

In some of these latter specimens it would be difficult to persuade the eye that the object was not a Cyclopian wall of rounded and square blocks built up by the hand of man, nor is the delusion dispelled by a close examination of the rock. The spaces between the apparently separated blocks are seemingly in need of "pointing up," but otherwise there seems to be a material at the junction different from the mass of the rock.

At one blow of the hammer a shell varying in thickness from $\frac{1}{4}$ to $\frac{3}{4}$ inch and discolored by weathering, though not friable, falls off and the surface beneath is seen to be of normal structure, texture and tenacity.

One curious part of this phenomenon is the tendency of the weathered surface to become conchoidal, even where the face of the rock is plane. It results from the gradual sinking of the outside surface towards the depressions that form the divisions between the separate blocks. The mode of formation of these curious false walls appear to be first, the gradual solutions of parts of the Labradorite matrix between the hornblende crystals.

Certain lines are more readily soluble than others, and these gradually deepen as the troughs that are formed conduct more water over the most yielding parts. The small crystals of hornblende in such troughs after losing their support falls out and are washed away, and at the same time the sides of these miniature troughs being constantly subjected to the solvent action of running water and the trituration of the suspended matter wear away, forming curved sides deepening towards the axes of the troughs.

As to why the whole texture of the rock should become concretionary and the whole outside surface peel off in one large scale, thick enough to preserve this wall like appearance, I am not know prepared to express an opinion, but hope to be able to submit some hypothesis after further study.

I have observed a similar though not entirely identical phenomenon near the Real Dolores in New Mexico, where an apparently plutonic rock was divided on the exterior in a similar manner, but in this case the whole mass was concretionary.

It appears to open an entirely new question as to whether thick plates of igneous rocks (and *a fortiori* sandstones, &c.,) may not be *weathered* into concretions.

PAH-UTE CREMATION.

(*Read before the American Philosophical Society, Dec. 4th,* 1874.)

READING, Penna., Nov. 25th, 1874.

DR. J. L. LECONTE,

Dear Sir: —In the last issue of the "Popular Science Monthly," I noticed an editorial alluding to your paper upon the subject of "Cremation," as a custom of one of the tribes of Indians inhabiting California.

The same custom prevails amongst that sub-tribe of Pah-Utes, known as the Cottonwood, Corn Creek, Spring Mountain and Pah-rimp Spring Indians. The varying local names are due only to the locality they inhabit, and they are one and the same tribe in reality. While attached to Lt. Wheeler's Expedition of 1871-2, I had ample opportunity to investigate anything pertaining to scientific subjects, and I took special care to collect all facts relating to the habits, customs, and superstitions of the Indian tribes through whose territory we passed.

The tract of country alluded to, as occupied by this sub-tribe of Pah-Utes, lies between 115° and 115°35′ west longitude, and latitude north 35° and 36°. Spring Mountain being their stronghold, and is located just north of the "old Spanish Trail." By means of an interpreter, I obtained the following information. Upon the death of one of these Indians, a pile of wood is prepared in the immediate vicinity; this is so arranged as to form a rectangle, to the heighth of from two to three feet. The corpse is laid upon this, when the fire is started, after which wood is continually thrown across the pile until the body is reduced as much as possible. Mesquite, pine and cedar is usually employed, and forms excellent coals and an intense heat. All the remaining property,—as wearing apparel, arms, blankets, dogs and horse, (if the deceased possessed any)—is also burnt. These last named valuables, I have no doubt,